INCH-POUND

MIL-M-38510/327B
15 September 2003
SUPERSEDING
MIL-M-38510/327A
10 December 1982

MILITARY SPECIFICATION

# MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL, COUNTERS, MONOLITHIC SILICON

Inactive for new design after 18 April 1997.

This specification is approved for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, low-power Schottky TTL, binary and decade counters microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

1.2 Part number. The part number should be in accordance with MIL-PRF-38535, and as specified herein.

1.2.1 Device types. The device types should be as follows:

| Device type | Circuit |
|---|---|
| 01 | Dual decade counter with A and B inputs |
| 02 | Dual 4 bit binary counter |
| 03 | Dual decade counter with clear and set-to-nine |

1.2.2 Device class. The device class should be the product assurance level as defined in MIL-PRF-38535.

1.2.3 Case outlines. The case outlines should be as designated in MIL-STD-1835 and as follows:

| Outline letter | Descriptive designator | Terminals | Package style |
|---|---|---|---|
| A | GDFP5-F14 or CDFP6-F14 | 14 | Flat pack |
| B | GDFP4-14 | 14 | Flat pack |
| C | GDIP1-T14 or CDIP2-T14 | 14 | Dual-in-line |
| D | GDFP1-F14 or CDFP2-F14 | 14 | Flat pack |
| E | GDIP1-T16 or CDIP2-T16 | 16 | Dual-in-line |
| F | GDFP2-F16 or CDFP3-F16 | 16 | Flat pack |
| 2 | CQCC1-N20 | 20 | Square leadless chip carrier |

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, P. O. Box 3990, Columbus, OH 43216-5000, by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 5962

1.3 Absolute maximum ratings.

| | |
|---|---|
| Supply voltage range | -0.5 V to 7.0 V |
| Input voltage range | -1.5 V dc at -18 mA to 5.5 V dc |
| Storage temperature range | -65° to +150°C |
| Maximum power dissipation ($P_D$) 1/ | 143 mW dc |
| Lead temperature (soldering, 10 seconds) | 300°C |
| Thermal resistance, junction to case ($\theta_{JC}$): | |
| Cases A, B, C, D, E, F, and 2 | (See MIL-STD-1835) |
| Junction temperature ($T_J$) 2/ | +175°C |

1.4 Recommended operating conditions.

| | |
|---|---|
| Supply voltage ($V_{CC}$) | 4.5 V minimum to 5.5 V maximum |
| Minimum high level input voltage ($V_{IH}$) | 2.0 V |
| Maximum low level input voltage ($V_{IL}$) | 0.7 V |
| Case operating temperature range ($T_C$) | -55°C to +125°C |
| Normalized fanout (each output) | 10 maximum |
| Width of input count pulse, $t_{P(IN)}$: | |
| Input A, clock | 20 ns minimum |
| Input B | 25 ns minimum |
| Width of clear pulse | 20 ns minimum |
| Input clock frequency ($F_{MAX}$): | |
| Input A (Types 01, 02, 03) | 0 to 25 MHz |
| Input B (Type 01) | 0 to 12.5 MHz |
| Setup time (Types 01 and 02) | |
| Clear inactive state setup time (time for clear ↓ to A or B input ↓) | 35 ns minimum |

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and Standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Departments of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38535 - Integrated Circuits (Microcircuits) Manufacturing, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard for Microelectronics.
MIL-STD-1835 - Interface Standard Electronic Component Case Outlines

(Unless otherwise indicated, copies of the above specifications and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

_____

1/ Must withstand the added $P_D$ due to short-circuit test (e.g., $I_{OS}$).
2/ Maximum junction temperature shall not be exceeded except for allowable short duration burn-in screening conditions in accordance with MIL-PRF-38535.

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Microcircuits furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.4).

3.2 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein.

3.3.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.3.2 Logic diagrams. The logic diagrams shall be specified on figure 2.

3.3.3 Truth table. The truth table shall be as specified on figure 3.

3.3.4 Schematic circuits. The schematic circuits shall be maintained by the manufacturer and made available to the qualifying activity and the preparing activity upon request.

3.3.5 Case outlines. The case outlines shall be as specified in 1.2.3.

3.4 Lead material and finish. The lead material and finish shall be in accordance with MIL-PRF-38535 (see 6.6).

3.5 Electrical performance characteristics. The electrical performance characteristics are as specified in table I, and apply over the full recommended case operating temperature range, unless otherwise specified.

3.6 Electrical test requirements. The electrical test requirements for each device class shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table III.

3.7 Marking. Marking shall be in accordance with MIL-PRF-38535.

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 12 (see MIL-PRF-38535, appendix A).

4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38535 and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

a. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.

c. Additional screening for space level product shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 Technology Conformance inspection (TCI). Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table III of MIL-PRF-38535 and as follows:

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, and 6 shall be omitted.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II MIL-PRF-38535.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table IV of MIL-PRF-38535 and as follows:

a. End-point electrical parameters shall be as specified in table II herein.

b. The steady-state life test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table V of MIL-PRF-38535. End-point electrical parameters shall be as specified in table II herein.

4.5 Methods of inspection. Methods of inspection shall be specified and as follows:

4.5.1 Voltage and current. All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional and positive when flowing into the referenced terminal.

TABLE I. Electrical performance characteristics.

| Test | Symbol | Conditions<br>$-55°C \le T_C \le +125°C$ | | Device type | Limits | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | |
| High level output voltage | $V_{OH}$ | $V_{CC}$ = 4.5 V, $V_{IH}$ = 2.0 V,<br>$V_{IL}$ = 0.7 V, $I_{OH}$ = -400 µA | | All | 2.5 | | V |
| Low level output voltage | $V_{OL}$ | $V_{CC}$ = 4.5 V, $V_{IL}$ = 0.7 V,<br>$V_{IH}$ = 2.0 V, $I_{OL}$ = 4 mA | | All | | 0.4 | V |
| Input clamp voltage | $V_{IC}$ | $V_{CC}$ = 4.5 V, $I_{IN}$ = -18 mA,<br>$T_C$ = +25°C | | All | | -1.5 | V |
| High level input current at clear or set to 9 inputs | $I_{IH1}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 2.7 V | | All | | 20 | µA |
| High level input current at clear or set to 9 inputs | $I_{IH4}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 5.5 V | | All | | 100 | µA |
| High level input current at input A or clock | $I_{IH2}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 2.7 V | | All | | 100 | µA |
| High level input current at input A or clock | $I_{IH5}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 5.5 V | | 01, 03 | | 200 | µA |
| | | | | 02 | | 400 | |
| High level input current at input B | $I_{IH3}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 2.7 V | | 01 | | 200 | µA |
| High level input current at input B | $I_{IH6}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 5.5 V | | 01 | | 400 | µA |
| Low level input current at clear or set to 9 inputs | $I_{IL1}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 0.4 V | | 01, 02 | -120 | -400 | µA |
| | | | | 03 | -135 | -400 | |
| Low level input current at input A | $I_{IL2}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 0.4 V | | All | -.35 | -2.4 | mA |
| Low level input current at input B | $I_{IL3}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 0.4 V | | 01 | -.60 | -3.2 | mA |
| Short circuit output current | $I_{OS}$ | $V_{CC}$ = 5.5 V 1/ | | All | -15 | -100 | mA |
| Supply current | $I_{CC}$ | $V_{CC}$ = 5.5 V, $V_{IN}$ = 0 V | | All | | 26 | mA |
| Maximum input clock frequency, A or CLK | $F_{MAX1}$ | $V_{CC}$ = 5.0 V, $C_L$ = 50 pF,<br>$R_L$ = 2 kΩ | | All | 25 | | MHz |
| Maximum input clock frequency, B | $F_{MAX2}$ | $V_{CC}$ = 5.0 V, $C_L$ = 50 pF,<br>$R_L$ = 2 kΩ | | 01 | 12.5 | | MHz |
| Propagation delay time, low-to-high | $t_{PLH1}$ | $V_{CC}$ = 5.0 V, | A to QC | 01 | 2 | 84 | ns |
| | | $C_L$ = 50 pF, | A to QA | 02 | 2 | 33 | |
| | | $R_L$ = 2 kΩ | CLK to QA | 03 | 2 | 33 | |
| Propagation delay time, high to low | $t_{PHL1}$ | $V_{CC}$ = 5.0 V, | A to QC | 01 | 2 | 84 | ns |
| | | $C_L$ = 50 pF, | A to QA | 02 | 2 | 33 | |
| | | $R_L$ = 2 kΩ | CLK to G | 03 | 2 | 33 | |

1/ Not more than one output should be shorted at a time.

TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions<br>$-55°C \le T_C \le +125°C$ | | Device type | Limits | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | | Min | Max | |
| Propagation delay time, low-to-high | $t_{PLH2}$ | $V_{CC}$ = 5.0 V,<br>$C_L$ = 50 pF,<br>$R_L$ = 2 kΩ | B to QD | 01 | 2 | 34 | ns |
| | | | A to QD | 02 | 2 | 93 | |
| | | | CLK to QA | 03 | 2 | 77 | |
| Propagation delay time, high to low | $t_{PHL2}$ | $V_{CC}$ = 5.0 V,<br>$C_L$ = 50 pF,<br>$R_L$ = 2 kΩ | B to QD | 01 | 2 | 34 | ns |
| | | | A to QD | 02 | 2 | 93 | |
| | | | CLK to QC | 03 | 2 | 77 | |
| Propagation delay time, high-to-low level, CLR to Q | $t_{PHL3}$ | $V_{CC}$ = 5.0 V<br>$C_L$ = 50 pF, $R_L$ = 2 kΩ | | All | 2 | 56 | ns |
| Propagation delay time, low to high level, set to 9 to QA | $t_{PLH4}$ | $V_{CC}$ = 5.0 V<br>$C_L$ = 50 pF, $R_L$ = 2 kΩ | | 03 | 2 | 57 | ns |
| Propagation delay time, high to low level, set to 9 to QB | $t_{PHL4}$ | $V_{CC}$ = 5.0 V<br>$C_L$ = 50 pF, $R_L$ = 2 kΩ | | 03 | 2 | 53 | ns |

TABLE II. Electrical test requirements.

| MIL-PRF-38535 test requirements | Subgroups (see table III) | |
|---|---|---|
| | Class S devices | Class B devices |
| Interim electrical parameters | 1 | 1 |
| Final electrical test parameters | 1*, 2, 3, 7, 9, 10, 11 | 1*, 2, 3, 7, 9 |
| Group A test requirements | 1, 2, 3, 7, 8, 9, 10, 11 | 1, 2, 3, 7, 9, 10, 11 |
| Group B electrical test parameters when using the method 5005 QCI option | 1, 2, 3, 7, 8 9, 10, 11 | N/A |
| Group C end-point electrical parameters | 1, 2, 3, 7, 8 9, 10, 11 | 1, 2, 3 |
| Group D end-point electrical parameters | 1, 2, 3 | 1, 2, 3 |

*PDA applies to subgroup 1.

| Terminal number | Terminal symbol | | | | | |
|---|---|---|---|---|---|---|
| | Device type 01 | | Device type 02 | | Device type 03 | |
| | Case E, F | Case 2 | Case A, B, C, D | Case 2 | Case E, F | Case 2 |
| 1 | 1A | NC | 1A | NC | 1CLK | NC |
| 2 | 1CLR | 1A | 1CLR | 1A | 1CLR | 1CLK |
| 3 | 1QA | 1CLR | 1QA | 1CLR | 1QA | 1CLR |
| 4 | 1B | 1QA | 1QB | 1QA | 1 SET T0 9 | 1QA |
| 5 | 1QB | 1B | 1QC | NC | 1QB | 1 SET T0 9 |
| 6 | 1QC | NC | 1QD | 1QB | 1QC | NC |
| 7 | 1QD | 1QB | GND | NC | 1QD | 1QB |
| 8 | GND | 1QC | 2QD | 1QC | GND | 1QC |
| 9 | 2QD | 1QD | 2QC | 1QD | 2QD | 1QD |
| 10 | 2QC | GND | 2QB | GND | 2QC | GND |
| 11 | 2QB | NC | 2QA | NC | 2QB | NC |
| 12 | 2B | 2QD | 2CLR | 2QD | 2 SET TO 9 | 2QD |
| 13 | 2QA | 2QC | 2A | 2QC | 2QA | 2QC |
| 14 | 2CLR | 2QB | $V_{CC}$ | 2QB | 2CLR | 2QB |
| 15 | 2A | 2B | | NC | 2CLK | 2 SET TO 9 |
| 16 | $V_{CC}$ | NC | | 2QA | $V_{CC}$ | NC |
| 17 | | 2QA | | NC | | 2QA |
| 18 | | 2CLR | | 2CLR | | 2CLR |
| 19 | | 2A | | 2A | | 2CLK |
| 20 | | $V_{CC}$ | | $V_{CC}$ | | $V_{CC}$ |

FIGURE 1. Terminal connections.

DEVICE TYPE 01

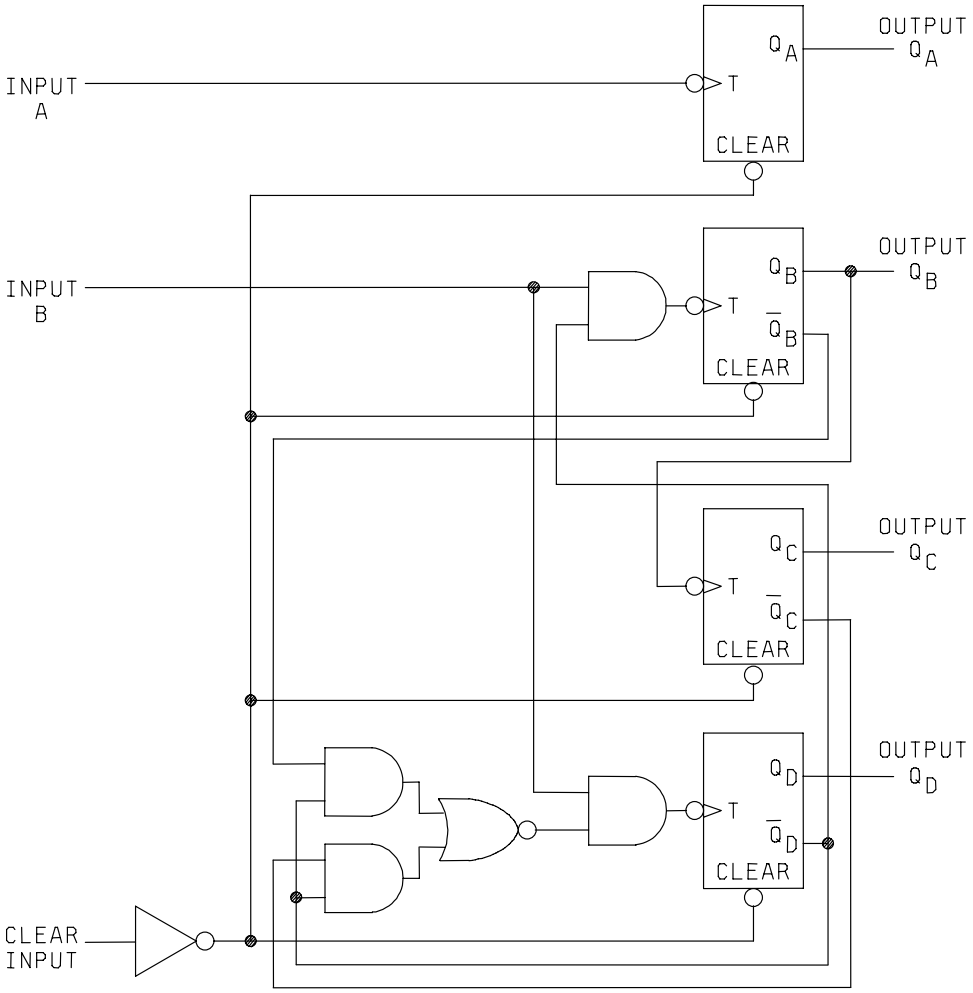



FIGURE 2. Logic diagrams (each counter).

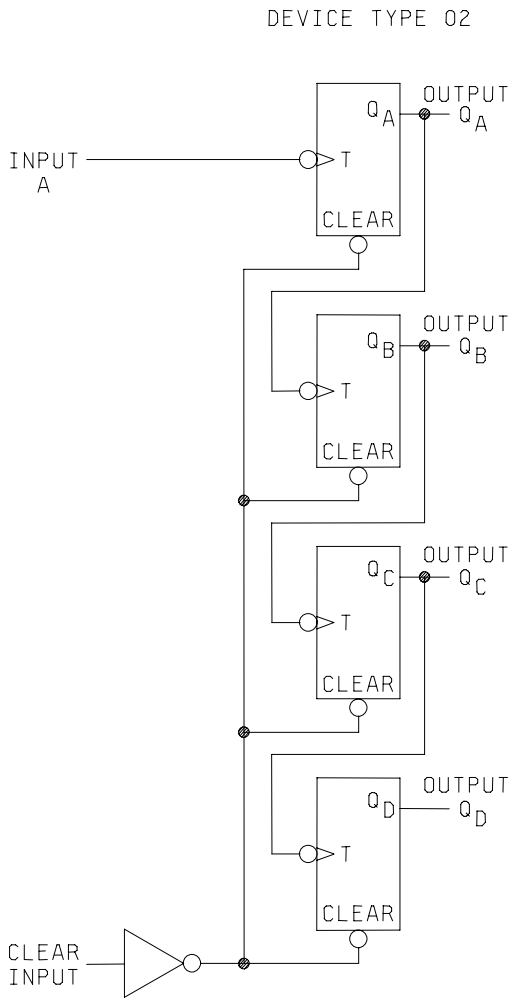



FIGURE 2. Logic diagrams (each counter) - Continued.

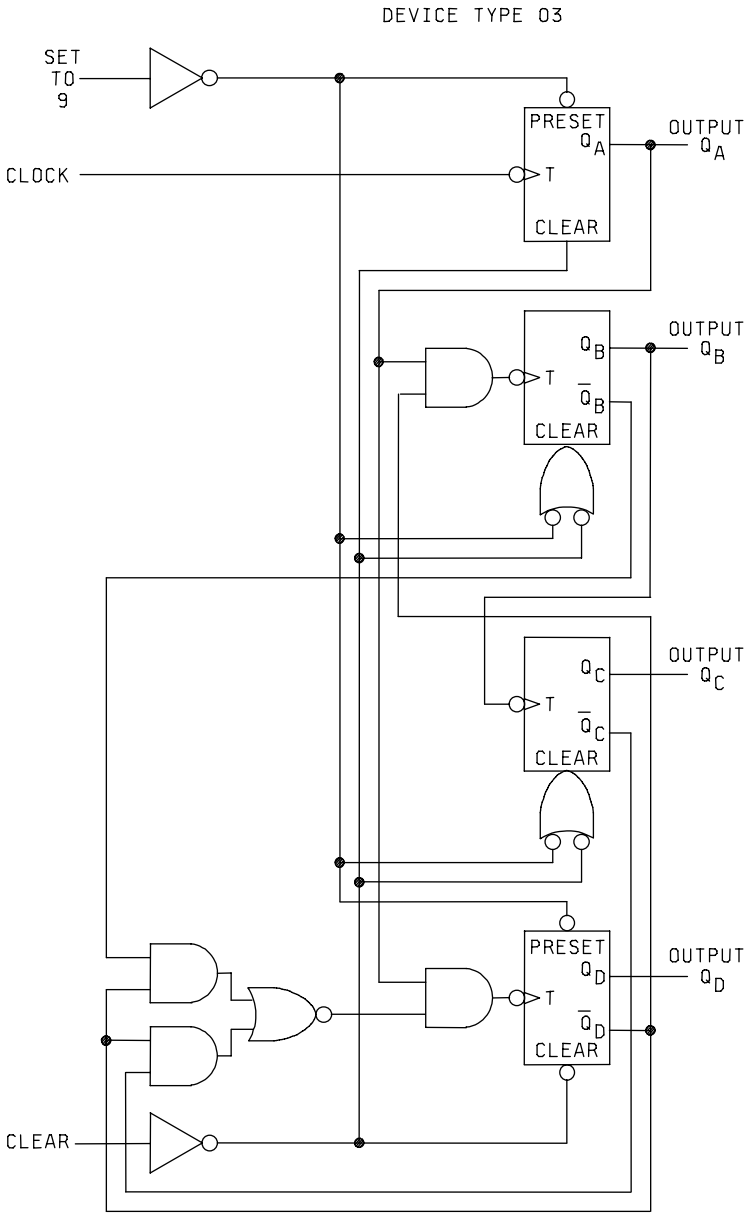



FIGURE 2. Logic diagrams (each counter) - Continued.

Device types 01

EACH COUNTER

BCD COUNT SEQUENCE
(See Note A)

| COUNT | OUTPUT | | | |
|---|---|---|---|---|
| | QD | QC | QB | QA |
| 0 | L | L | L | L |
| 1 | L | L | L | H |
| 2 | L | L | H | L |
| 3 | L | L | H | H |
| 4 | L | H | L | L |
| 5 | L | H | L | H |
| 6 | L | H | H | L |
| 7 | L | H | H | H |
| 8 | H | L | L | L |
| 9 | H | L | L | H |

BI-QUINARY (5-2)
(See Note B)

| COUNT | OUTPUT | | | |
|---|---|---|---|---|
| | QA | QD | QC | QB |
| 0 | L | L | L | L |
| 1 | L | L | L | H |
| 2 | L | L | H | L |
| 3 | L | L | H | H |
| 4 | L | H | L | L |
| 5 | H | L | L | L |
| 6 | H | L | L | H |
| 7 | H | L | H | L |
| 8 | H | L | H | H |
| 9 | H | H | L | L |

NOTES:
A. Output QA is connected to input B for BCD count.
B. Output QD is connected to input A for bi-quinary count.

Device type 02

EACH COUNTER
COUNT SEQUENCE

| COUNT | OUTPUT | | | |
|---|---|---|---|---|
| | QD | QC | QB | QA |
| 0 | L | L | L | L |
| 1 | L | L | L | H |
| 2 | L | L | H | L |
| 3 | L | L | H | H |
| 4 | L | H | L | L |
| 5 | L | H | L | H |
| 6 | L | H | H | L |
| 7 | L | H | H | H |
| 8 | H | L | L | L |
| 9 | H | L | L | H |
| 10 | H | L | H | L |
| 11 | H | L | H | H |
| 12 | H | H | L | L |
| 13 | H | H | L | H |
| 14 | H | H | H | L |
| 15 | H | H | H | H |

FIGURE 3. Truth tables.

Device type 03

BCD COUNT SEQUENCE
(EACH COUNTER)

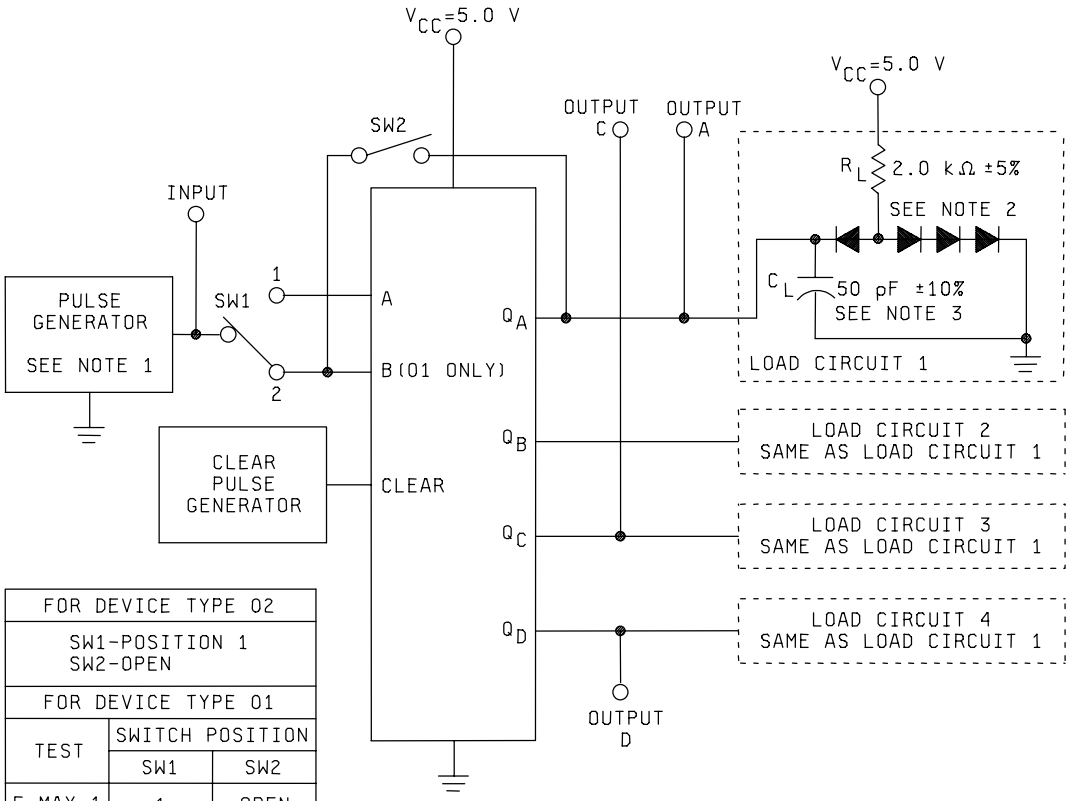
| COUNT | OUTPUT | | | |
|---|---|---|---|---|
| | QD | QC | QB | QA |
| 0 | L | L | L | L |
| 1 | L | L | L | H |
| 2 | L | L | H | L |
| 3 | L | L | H | H |
| 4 | L | H | L | L |
| 5 | L | H | L | H |
| 6 | L | H | H | L |
| 7 | L | H | H | H |
| 8 | H | L | L | L |
| 9 | H | L | L | H |

CLEAR/SET TO 9
FUNCTION TABLE
(EACH COUNTER)

| INPUTS | | OUTPUTS | | | |
|---|---|---|---|---|---|
| CLEAR | SET TO 9 | QA | QB | QC | QD |
| H | L | L | L | L | L |
| L | H | H | L | L | H |
| L | L | COUNT | | | |

H = high level, L = low level

FIGURE 3. Truth tables - Continued.

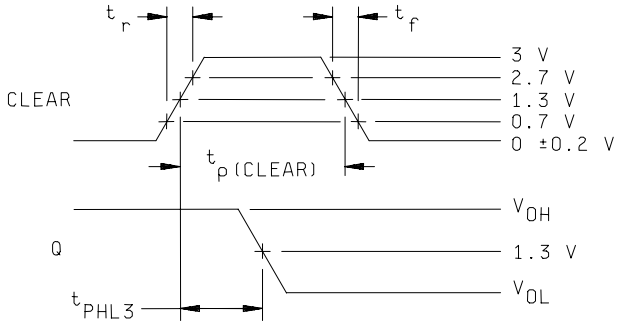



| FOR DEVICE TYPE 02 | | |
|---|---|---|
| SW1-POSITION 1<br>SW2-OPEN | | |
| FOR DEVICE TYPE 01 | | |
| TEST | SWITCH POSITION | |
| | SW1 | SW2 |
| F MAX 1 | 1 | OPEN |
| F MAX 2 | 2 | OPEN |
| A TO $Q_C$ | 1 | CLOSED |
| B TO $Q_D$ | 2 | OPEN |

TEST CIRCUIT

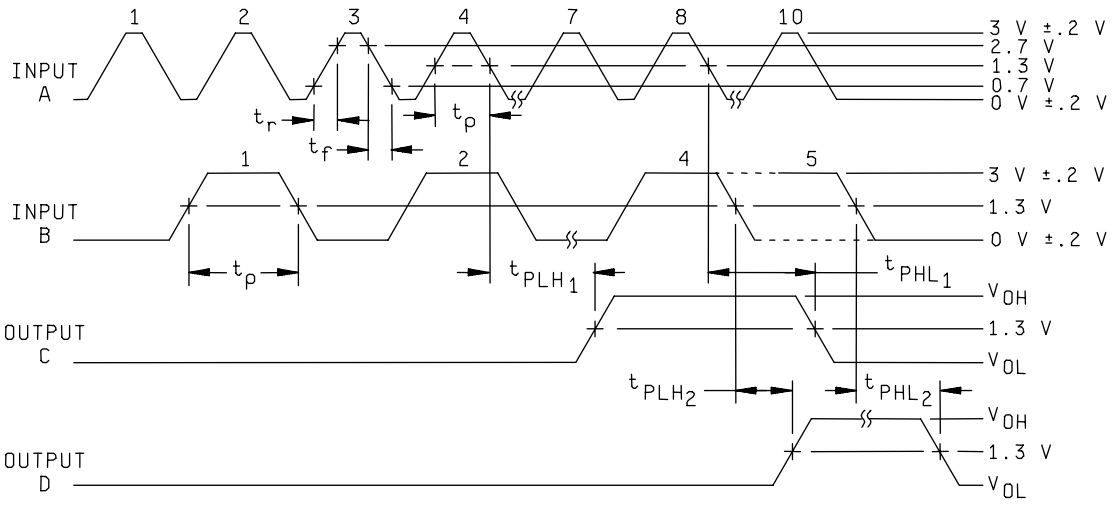
NOTES:

1. The pulse generator has the following characteristics: $V_{gen}$ = 3 V, $t_r \leq 15$ ns, $t_f \leq 6$ ns, $t_p$ = .5 µs, PRR ≤ 1 MHz, Zout ≈ 50, $t_{p(clear)} \geq 20$ ns, $t_{p(clear)} \geq 35$ ns for device 02.
2. All diodes are 1N3064 or equivalent.
3. $C_L$ includes probe and jig capacitance.
4. Voltage values are with respect to ground teminal.
5. F maximum: $t_r = t_f \leq 6$ ns.

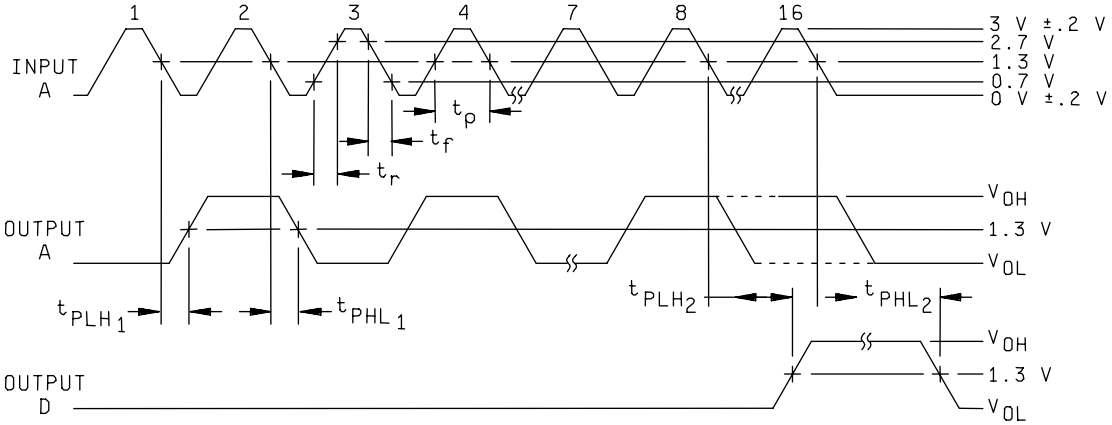



CLEAR VOLTAGE WAVEFORMS TYPES 01 AND 02

FIGURE 4. Switching time test circuit and waveforms for device types 01 and 02.

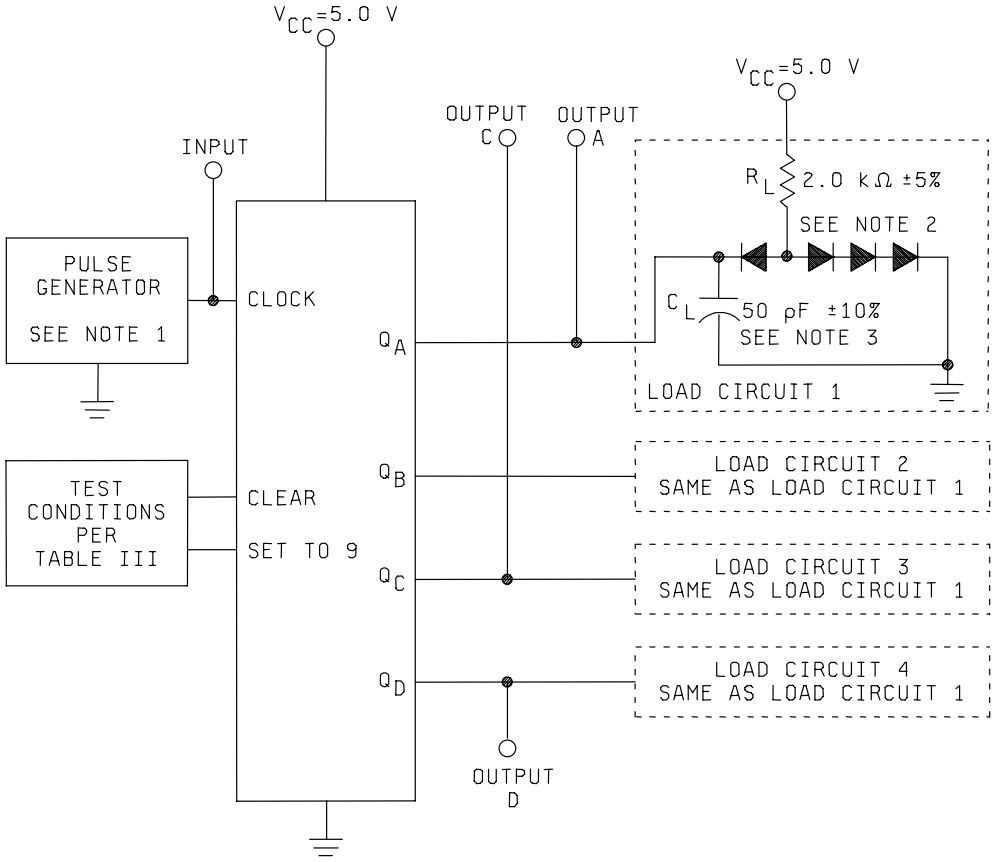



COUNT VOLTAGE WAVEFORMS, TYPE 01




COUNT VOLTAGE WAVEFORMS, TYPE 02

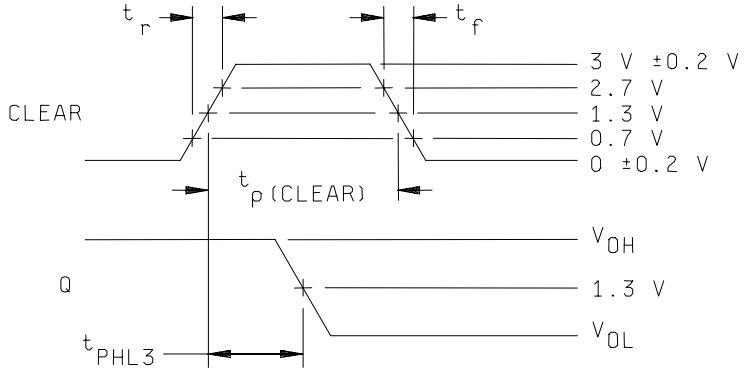
FIGURE 4. Switching time test circuit and waveforms for device types 01 and 02 - Continued.




TEST CIRCUIT

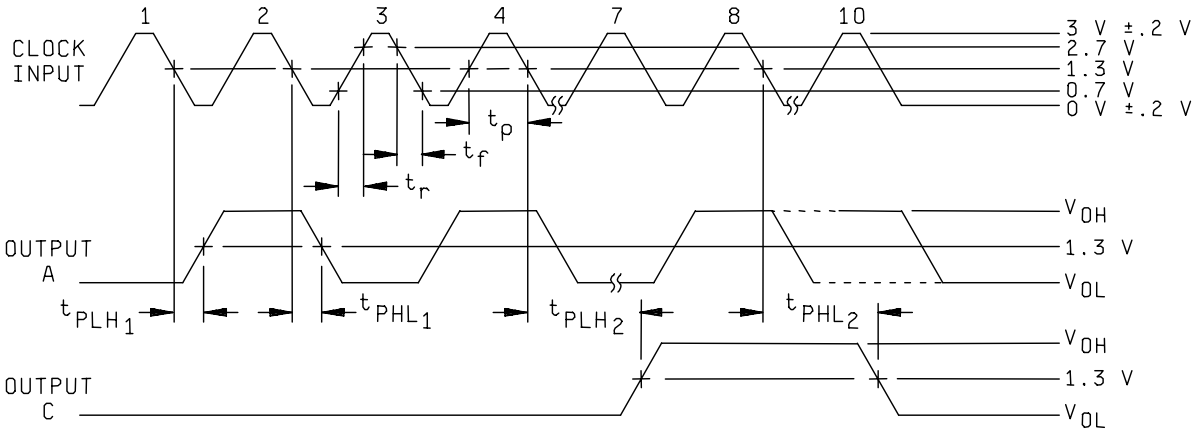
NOTES:

1. The pulse generator has the following characteristics: $V_{gen}$ = 3 V, $t_r \leq 15$ ns, $t_f \leq 6$ ns, $t_p$ = .5 µs, PRR ≤ 1 MHz, Zout ≈ 50, $t_{p(clear)} \geq 20$ ns.
2. All diodes are 1N3064 or equivalent.
3. $C_L$ includes probe and jig capacitance.
4. Voltage values are with respect to ground teminal.
5. F maximum: $t_r = t_f \leq 6$ ns.

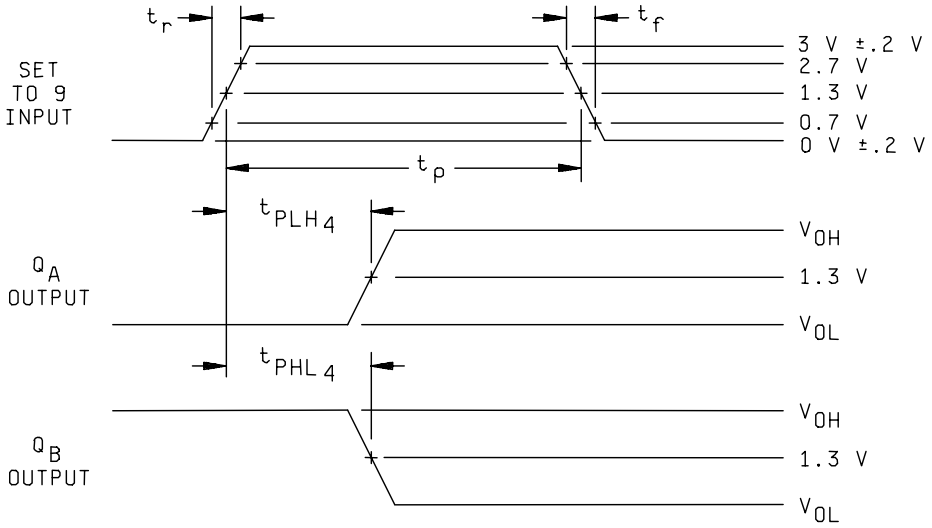



CLEAR VOLTAGE WAVEFORMS

FIGURE 5. Switching time test circuit and waveforms for device types 03.




COUNT VOLTAGE WAVEFORMS




SET-TO-NINE VOLTAGE WAVEFORMS

FIGURE 5. Switching time test circuit and waveforms for device types 03 - Continued.

TABLE III. Group A inspection for device type 01.

Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases E, F Case 2 Test no. | 1 2 1A | 2 3 1CLR | 3 4 1QA | 4 5 1B | 5 7 1QB | 6 8 1QC | 7 9 1QD | 8 10 GND | 9 12 2QD | 10 13 2QC | 11 14 2QB | 12 15 2B | 13 17 2QA | 14 18 2CLR | 15 19 2A | 16 20 $V_{CC}$ | Measured terminal | Limits Min | Limits Max | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Tc = 25°C | $V_{OH}$ | 3006 | 1 | 1/ | 2/ | -0.4 mA | | | | | GND | | | | | | | | 4.5 V | 1QA | 2.5 | | V |
| | | " | 2 | | " | | 1/ | -0.4 mA | | | " | | | | | | | | " | 1QB | " | | " |
| | | " | 3 | | " | | 3/ | | -0.4 mA | | " | | | | | | | | " | 1QC | " | | " |
| | | " | 4 | | " | | 4/ | | | -0.4 mA | " | | | | | | | | " | 1QD | " | | " |
| | | " | 5 | | | | | | | | " | | | | -0.4 mA | 2/ | 1/ | | " | 2QA | " | | " |
| | | " | 6 | | | | | | | | " | | | -0.4 mA | 1/ | | | | " | 2QB | " | | " |
| | | " | 7 | | | | | | | | " | | -0.4 mA | | 3/ | | | | " | 2QC | " | | " |
| | | " | 8 | | | | | | | | " | -0.4 mA | | | 4/ | | | | " | 2QD | " | | " |
| | $V_{OL}$ | 3007 | 9 | | 2.0 V | 5/ | | | | | " | | | | | | | | " | 1QA | | 0.4 | " |
| | | " | 10 | | " | | | 4 mA | | | " | | | | | | | | " | 1QB | | " | " |
| | | " | 11 | | " | | | | 4 mA | | " | | | | | | | | " | 1QC | | " | " |
| | | " | 12 | | " | | | | | 4 mA | " | | | | | | | | " | 1QD | | " | " |
| | | " | 13 | | | | | | | | " | | | | 5/ | 2.0 V | | | " | 2QA | | " | " |
| | | " | 14 | | | | | | | | " | | | 4 mA | | " | | | " | 2QB | | " | " |
| | | " | 15 | | | | | | | | " | | 4 mA | | | " | | | " | 2QC | | " | " |
| | | " | 16 | | | | | | | | " | 4 mA | | | | " | | | " | 2QD | | " | " |
| | $V_{IC}$ | | 17 | -18 mA | | | | | | | " | | | | | | | | " | 1A | | -1.5 | " |
| | | | 18 | | -18 mA | | | | | | " | | | | | | | | " | 1CLR | | " | " |
| | | | 19 | | | | -18 mA | | | | " | | | | | | | | " | 1B | | " | " |
| | | | 20 | | | | | | | | " | | | | -18 mA | | | | " | 2B | | " | " |
| | | | 21 | | | | | | | | " | | | | | -18 mA | | | " | 2CLR | | " | " |
| | | | 22 | | | | | | | | " | | | | | | -18 mA | | " | 2A | | " | " |
| | $I_{IL1}$ | 3009 | 23 | | 0.4 V | | | | | | " | | | | | | | | 5.5 V | 1CLR | 6/ | 6/ | 6/ |
| | $I_{IL2}$ | " | 24 | 0.4 V | GND | | | | | | " | | | | | | | | " | 1A | " | " | " |
| | $I_{IL3}$ | " | 25 | | GND | | 0.4 V | | | | " | | | | | | | | " | 1B | " | " | " |
| | $I_{IL1}$ | " | 26 | | | | | | | | " | | | | | 0.4 V | | | " | 2CLR | " | " | " |
| | $I_{IL2}$ | " | 27 | | | | | | | | " | | | | | GND | 0.4 V | | " | 2A | " | " | " |
| | $I_{IL3}$ | " | 28 | | | | | | | | " | | | | 0.4 V | GND | | | " | 2B | " | " | " |
| | $I_{IH1}$ | 3010 | 29 | | 2.7 V | | | | | | " | | | | | | | | " | 1CLR | | 20 | µA |
| | $I_{IH2}$ | " | 30 | 2.7 V | | | | | | | " | | | | | | | | " | 1A | | 100 | " |
| | $I_{IH3}$ | " | 31 | | | | 2.7 V | | | | " | | | | | | | | " | 1B | | 200 | " |
| | $I_{IH1}$ | " | 32 | | | | | | | | " | | | | | 2.7 V | | | " | 2CLR | | 20 | " |
| | $I_{IH2}$ | " | 33 | | | | | | | | " | | | | | | 2.7 V | | " | 2A | | 100 | " |
| | $I_{IH3}$ | " | 34 | | | | | | | | " | | | | 2.7 V | | | | " | 2B | | 200 | " |
| | $I_{IH4}$ | " | 35 | | 5.5 V | | | | | | " | | | | | | | | " | 1CLR | | 100 | " |
| | $I_{IH5}$ | " | 36 | 5.5 V | | | | | | | " | | | | | | | | " | 1A | | 200 | " |
| | $I_{IH6}$ | " | 37 | | | | 5.5 V | | | | " | | | | | | | | " | 1B | | 400 | " |
| | $I_{IH4}$ | " | 38 | | | | | | | | " | | | | | 5.5 V | | | " | 2CLR | | 100 | " |
| | $I_{IH5}$ | " | 39 | | | | | | | | " | | | | | | 5.5 V | | " | 2A | | 200 | " |
| | $I_{IH6}$ | " | 40 | | | | | | | | " | | | | 5.5 V | | | | " | 2B | | 400 | " |
| | $I_{OS}$ | 3011 | 41 | 1/ | 2/ | GND | | | | | " | | | | | | | | " | 1QA | -15 | -100 | mA |
| | | " | 42 | | " | | 1/ | GND | | | " | | | | | | | | " | 1QB | " | " | " |
| | | " | 43 | | " | | 3/ | | GND | | " | | | | | | | | " | 1QC | " | " | " |
| | | " | 44 | | " | | 4/ | | | GND | " | | | | | | | | " | 1QD | " | " | " |
| | | " | 45 | | | | | | | | " | | | | GND | 2/ | 1/ | | " | 2QA | " | " | " |
| | | " | 46 | | | | | | | | " | | | GND | 1/ | | | | " | 2QB | " | " | " |
| | | " | 47 | | | | | | | | " | | GND | | 3/ | | | | " | 2QC | " | " | " |
| | | " | 48 | | | | | | | | " | GND | | | 4/ | | | | " | 2QD | " | " | " |
| | $I_{CC}$ | 3005 | 49 | GND | 2/ | GND | | | | | " | | | | GND | | " | GND | " | $V_{CC}$ | | 26 | " |
| 2 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = +125°C and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = -55°C and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | | | |

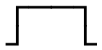
See footnotes at end of device type 01.

TABLE III. Group A inspection for device type 01 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases E, F Case 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Measured terminal | Limits | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 7 | 8 | 9 | 10 | 12 | 13 | 14 | 15 | 17 | 18 | 19 | 20 | | | | |
| | | | Test no. | 1A | 1CLR | 1QA | 1B | 1QB | 1QC | 1QD | GND | 2QD | 2QC | 2QB | 2B | 2QA | 2CLR | 2A | $V_{CC}$ | | Min | Max | |
| 7 Tc = 25°C 7/ | Truth table tests | 3014 | 50 8/ | A | A | L | A | L | L | L | GND | L | L | L | A | L | A | A | 5.0 V | | 9/ | | |
| | | " | 51 | A | " | " | B | " | " | " | " | " | " | " | B | " | " | A | " | | | | |
| | | " | 52 | B | " | " | B | " | " | " | " | " | " | " | B | " | " | B | " | | | | |
| | | " | 53 | " | " | " | A | " | " | " | " | " | " | " | A | " | " | " | " | | | | |
| | | " | 54 | " | B | " | A | " | " | " | " | " | " | " | A | " | B | " | " | | | | |
| | | " | 55 | " | " | " | B | H | " | " | " | " | " | H | B | " | " | " | " | | | | |
| | | " | 56 | " | " | " | A | H | " | " | " | " | " | H | A | " | " | " | " | | | | |
| | | " | 57 | " | " | " | B | L | H | " | " | " | H | L | B | " | " | " | " | | | | |
| | | " | 58 | " | " | " | A | L | " | " | " | " | " | L | A | " | " | " | " | | | | |
| | | " | 59 | " | " | " | B | H | " | " | " | " | " | H | B | " | " | " | " | | | | |
| | | " | 60 | " | " | " | A | H | " | " | " | " | " | H | A | " | " | " | " | | | | |
| | | " | 61 | " | " | " | B | L | L | H | " | H | L | L | B | " | " | " | " | | | | |
| | | " | 62 | " | " | " | A | " | " | H | " | H | " | " | A | " | " | " | " | | | | |
| | | " | 63 | " | " | " | B | " | " | L | " | L | " | " | B | " | " | " | " | | | | |
| | | " | 64 | A | " | " | " | " | " | " | " | " | " | " | " | " | " | A | " | | | | |
| | | " | 65 | B | " | H | " | " | " | " | " | " | " | " | " | H | " | B | " | | | | |
| 8 | Same tests, terminal conditions, and limits as for subgroup 7 tests at $T_C$ = +125°C and $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | | | |
| 9 Tc = 25°C | $F_{MAX1}$ | 3003 | 66 10/ | IN | GND | OUT | | | | | GND | | | | | | | | 5.0 V | 1A to 1QA | 25 | | MHz |
| | $F_{MAX1}$ | Fig. 4 | 67 10/ | | | | | | | | " | | | | | | OUT | GND | IN | " | 2A to 2QA | 25 | | " |
| | $F_{MAX2}$ | " | 68 10/ | | GND | | IN | | | OUT | " | | | | | | | | | " | 1B to 1QD | 12.5 | | " |
| | $F_{MAX2}$ | " | 69 10/ | | | | | | | | " | OUT | | | IN | | GND | | | " | 2B to 2QD | 12.5 | | " |
| | $t_{PLH1}$ | " | 70 | IN | GND | | | | OUT | | " | | | | | | | | | " | 1A to 1QC | 2 | 65 | ns |
| | $t_{PLH1}$ | " | 71 | | | | | | | | " | | OUT | | | | GND | IN | | " | 2A to 2QC | " | " | " |
| | $t_{PHL1}$ | " | 72 | IN | GND | | | | OUT | | " | | | | | | | | | " | 1A to 1QC | " | " | " |
| | $t_{PHL1}$ | " | 73 | | | | | | | | " | | OUT | | | | GND | IN | | " | 2A to 2QC | " | " | " |
| | $t_{PLH2}$ | " | 74 | | GND | | IN | | | OUT | " | | | | | | | | | " | 1B to 1QD | " | 26 | " |
| | $t_{PLH2}$ | " | 75 | | | | | | | | " | OUT | | | IN | | GND | | | " | 2B to 2QD | " | " | " |
| | $t_{PHL2}$ | " | 76 | | GND | | IN | | | OUT | " | | | | | | | | | " | 1B to 1QD | " | " | " |
| | $t_{PHL2}$ | " | 77 | | | | | | | | " | OUT | | | IN | | GND | | | " | 2B to 2QD | " | " | " |
| | $t_{PHL3}$ | " | 78 | 11/ | IN | OUT | | | | | " | | | | | | | | | " | 1CLR to 1QA | " | 44 | " |
| | | " | 79 | | " | | 11/ | OUT | | | " | | | | | | | | | " | 1CLR to 1QB | " | " | " |
| | | " | 80 | | " | | " | | OUT | | " | | | | | | | | | " | 1CLR to 1QC | " | " | " |
| | | " | 81 | | " | | " | | | OUT | " | | | | | | | | | " | 1CLR to 1QD | " | " | " |
| | | " | 82 | | | | | | | | " | | | | | OUT | IN | 11/ | | " | 2CLR to 2QA | " | " | " |
| | | " | 83 | | | | | | | | " | | | OUT | 11/ | | " | " | | " | 2CLR to 2QB | " | " | " |
| | | " | 84 | | | | | | | | " | | OUT | | " | | " | " | | " | 2CLR to 2QC | " | " | " |
| | | " | 85 | | | | | | | | " | OUT | | | " | | " | " | | " | 2CLR to 2QD | " | " | " |
| 10 Tc = 125°C | $F_{MAX1}$ | Same tests and terminal conditions as for subgroup 9, except $T_C$ = +125°C. | | | | | | | | | | | | | | | | | | | | 25 | | MHz |
| | $F_{MAX2}$ | | | | | | | | | | | | | | | | | | | | | 12.5 | | MHz |
| | $t_{PLH1}$ | | | | | | | | | | | | | | | | | | | | | 2 | 84 | ns |
| | $t_{PHL1}$ | | | | | | | | | | | | | | | | | | | | | " | 84 | " |
| | $t_{PLH2}$ | | | | | | | | | | | | | | | | | | | | | " | 34 | " |
| | $t_{PHL2}$ | | | | | | | | | | | | | | | | | | | | | " | 34 | " |
| | $t_{PHL3}$ | | | | | | | | | | | | | | | | | | | | | " | 56 | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | | | |

See footnotes on the next page.

TABLE III. Group A inspection for device type 01 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

1/ Apply  - - 2.0 V min./5.5 V max. prior to test after clear pulse.
0.0 ±0.2 V

2/ Apply  - - 2.0 V min./5.5 V max. pulse prior to test.
0.0 ±0.2 V

3/ Apply 2 pulses prior to test after clear pulse (see 1/).

4/ Apply 4 pulses prior to test after clear pulse (see 1/).

5/ For tests 9 and 13, $I_{IL3}$ maximum value pulse 4 mA shall be applied to output QA.

6/ $I_{IL}$ limits shall be as follows:

| Symbol | Min/Max limits (mA) | | |
|---|---|---|---|
| | Circuit | | |
| | A | E | B |
| $I_{IL1}$ | -.15/-.38 | -.12/-.36 | -.16/-.40 |
| $I_{IL2}$ | -.35/-1.6 | -1.0/-2.4 | -.35/-1.6 |
| $I_{IL3}$ | -.60/-2.4 | -1.3/-3.2 | -.60/-2.4 |

7/ Only a summary of attributes data is required.

8/ A = 2.4 V min. and B = 0.4 V max.

9/ Output voltages shall be either:
a. H ≥ 2.5 V and L ≤ 0.4 V when using a high speed double comparator, or
b. H ≥ 1.5 V and L ≤ 1.5 V when using a high speed single comparator.

10/ $F_{MAX1}$ and $F_{MAX2}$ minimum limits specified are the frequency of the input pulse.
The output pulse shall be one half the input frequency when measuring QA.
The output shall be one fifth of the input frequency when measuring QD.

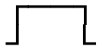
11/ Apply sufficient  - - 2.0 V min./5.5 V max. pulses to set output high prior to test.
0.0 ±0.2 V

TABLE III. Group A inspection for device type 02.

Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases A,B,C,D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Measured terminal | Limits | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case 2 | 2 | 3 | 4 | 6 | 8 | 9 | 10 | 12 | 13 | 14 | 16 | 18 | 19 | 20 | | | | |
| | | | Test no. | 1A | 1CLR | 1QA | 1QB | 1QC | 1QD | GND | 2QD | 2QC | 2QB | 2QA | 2CLR | 2A | $V_{CC}$ | | Min | Max | |
| 1 Tc = 25°C | $V_{OL}$ | 3007 | 1 | | 2.0 V | 4 mA | | | | GND | | | | | | | 4.5 V | 1QA | | 0.4 | V |
| | | " | 2 | | " | | 4 mA | | | " | | | | | | | " | 1QB | | " | " |
| | | " | 3 | | " | | | 4 mA | | " | | | | | | | " | 1QC | | " | " |
| | | " | 4 | | " | | | | 4 mA | " | | | | | | | " | 1QD | | " | " |
| | | " | 5 | | | | | | | " | | | | 4 mA | 2.0 V | | " | 2QA | | " | " |
| | | " | 6 | | | | | | | " | | | 4 mA | | " | | " | 2QB | | " | " |
| | | " | 7 | | | | | | | " | | 4 mA | | | " | | " | 2QC | | " | " |
| | | " | 8 | | | | | | | " | 4 mA | | | | " | | " | 2QD | | " | " |
| | $V_{OH}$ | 3006 | 9 | 1/ | 2/ | -400 µA | | | | " | | | | | | | " | 1QA | 2.5 | | " |
| | | " | 10 | " | " | | -400 µA | | | " | | | | | | | " | 1QB | " | | " |
| | | " | 11 | " | " | | | -400 µA | | " | | | | | | | " | 1QC | " | | " |
| | | " | 12 | " | " | | | | -400 µA | " | | | | | | | " | 1QD | " | | " |
| | | " | 13 | | | | | | | " | | | | -400 µA | 2/ | 1/ | " | 2QA | " | | " |
| | | " | 14 | | | | | | | " | | | -400 µA | | " | " | " | 2QB | " | | " |
| | | " | 15 | | | | | | | " | | -400 µA | | | " | " | " | 2QC | " | | " |
| | | " | 16 | | | | | | | " | -400 µA | | | | " | " | " | 2QD | " | | " |
| | $V_{IC}$ | | 17 | -18 mA | | | | | | " | | | | | | | " | 1A | | -1.5 | " |
| | | | 18 | | -18 mA | | | | | " | | | | | | | " | 1CLR | | " | " |
| | | | 19 | | | | | | | " | | | | | | -18 mA | " | 2A | | " | " |
| | | | 20 | | | | | | | " | | | | | -18 mA | | " | 2CLR | | " | " |
| | $I_{IL1}$ | 3009 | 21 | | 0.4 V | | | | | " | | | | | | | 5.5 V | 1CLR | 3/ | 3/ | 3/ |
| | $I_{IL1}$ | " | 22 | | | | | | | " | | | | | 0.4 V | | " | 2CLR | " | " | " |
| | $I_{IL2}$ | " | 23 | 0.4 V | GND | | | | | " | | | | | | | " | 1A | " | " | " |
| | $I_{IL2}$ | " | 24 | | | | | | | " | | | | | GND | 0.4 V | " | 2A | " | " | " |
| | $I_{IH1}$ | 3010 | 25 | | 2.7 V | | | | | " | | | | | | | " | 1CLR | | 20 | µA |
| | $I_{IH1}$ | " | 26 | | | | | | | " | | | | | 2.7 V | | " | 2CLR | | 20 | " |
| | $I_{IH2}$ | " | 27 | 2.7 V | | | | | | " | | | | | | | " | 1A | | 100 | " |
| | $I_{IH2}$ | " | 28 | | | | | | | " | | | | | | 2.7 V | " | 2A | | 100 | " |
| | $I_{IH4}$ | " | 29 | | 5.5 V | | | | | " | | | | | | | " | 1CLR | | 100 | " |
| | $I_{IH4}$ | " | 30 | | | | | | | " | | | | | 5.5 V | | " | 2CLR | | 100 | " |
| | $I_{IH5}$ | " | 31 | 5.5 V | | | | | | " | | | | | | | " | 1A | | 400 | " |
| | $I_{IH5}$ | " | 32 | | | | | | | " | | | | | | 5.5 V | " | 2A | | 400 | " |
| | $I_{OS}$ | 3011 | 33 | 1/ | 2/ | GND | | | | " | | | | | | | " | 1QA | -15 | -100 | mA |
| | | " | 34 | " | " | | GND | | | " | | | | | | | " | 1QB | " | " | " |
| | | " | 35 | " | " | | | GND | | " | | | | | | | " | 1QC | " | " | " |
| | | " | 36 | " | " | | | | GND | " | | | | | | | " | 1QD | " | " | " |
| | | " | 37 | | | | | | | " | | | | GND | 2/ | 1/ | " | 2QA | " | " | " |
| | | " | 38 | | | | | | | " | | | GND | | " | " | " | 2QB | " | " | " |
| | | " | 39 | | | | | | | " | | GND | | | " | " | " | 2QC | " | " | " |
| | | " | 40 | | | | | | | " | GND | | | | " | " | " | 2QD | " | " | " |
| | $I_{CC}$ | 3005 | 41 | GND | 2/ | | | | | " | | | | | " | GND | " | $V_{CC}$ | | 26 | " |
| 2 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = +125°C and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = -55°C and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of device type 02.

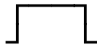
TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases A,B,C,D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Measured terminal | Limits | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case 2 | 2 | 3 | 4 | 6 | 8 | 9 | 10 | 12 | 13 | 14 | 16 | 18 | 19 | 20 | | | | |
| | | | Test no. | 1A | 1CLR | 1QA | 1QB | 1QC | 1QD | GND | 2QD | 2QC | 2QB | 2QA | 2CLR | 2A | $V_{CC}$ | | Min | Max | |
| 7 4/ Tc = 25°C | Truth table tests | 3014 | 42 | A | A | L | L | L | L | GND | L | L | L | L | A | A | 5.0 V | 5/ | | | |
| | | " | 43 | B | A | " | " | " | " | " | " | " | " | " | A | B | " | | | | |
| | | " | 44 | B | B | " | " | " | " | " | " | " | " | " | B | B | " | | | | |
| | | " | 45 | A | " | " | " | " | " | " | " | " | " | " | " | A | " | | | | |
| | | " | 46 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 47 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 48 | B | " | L | H | " | " | " | " | " | H | L | " | B | " | | | | |
| | | " | 49 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 50 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 51 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 52 | B | " | L | L | H | " | " | " | H | L | L | " | B | " | | | | |
| | | " | 53 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 54 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 55 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 56 | B | " | L | H | " | " | " | " | " | H | L | " | B | " | | | | |
| | | " | 57 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 58 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 59 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 60 | B | " | L | L | L | H | " | H | L | L | L | " | B | " | | | | |
| | | " | 61 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 62 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 63 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 64 | B | " | L | H | " | " | " | " | " | H | L | " | B | " | | | | |
| | | " | 65 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 66 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 67 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 68 | B | " | L | L | H | " | " | " | H | L | L | " | B | " | | | | |
| | | " | 69 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 70 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 71 | A | " | H | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 72 | B | " | L | H | " | " | " | " | " | H | L | " | B | " | | | | |
| | | " | 73 | A | " | L | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 74 | B | " | H | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 75 | B | A | L | L | L | L | " | L | L | L | L | A | B | " | | | | |
| 8 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = +125°C and $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | |
| 9 | $F_{MAX1}$ | 3003 | 76 6/ | IN | GND | OUT | | | | GND | | | | | | | 5.0 V | 1A to 1QA | 25 | | MHz |
| Tc = 25°C | $F_{MAX2}$ | " | 77 6/ | | | | | | | " | | | | OUT | GND | IN | " | 2A to 2QA | 25 | | MHz |
| | $t_{PLH1}$ | " | 78 | IN | GND | OUT | | | | " | | | | | | | " | 1A to 1QA | 2 | 25 | ns |
| | $t_{PLH1}$ | " | 79 | | | | | | | " | | | | OUT | GND | IN | " | 2A to 2QA | " | " | " |
| | $t_{PHL1}$ | " | 80 | IN | GND | OUT | | | | " | | | | | | | " | 1A to 1QA | " | " | " |
| | $t_{PHL1}$ | " | 81 | | | | | | | " | | | | OUT | GND | IN | " | 2A to 2QA | " | " | " |
| | $t_{PLH2}$ | " | 82 | IN | GND | | | | OUT | " | | | | | | | " | 1A to 1QD | " | 70 | " |
| | $t_{PLH2}$ | " | 83 | | | | | | | " | OUT | | | | GND | IN | " | 2A to 2QD | " | " | " |
| | $t_{PHL2}$ | " | 84 | IN | GND | | | | OUT | " | | | | | | | " | 1A to 1QD | " | " | " |
| | $t_{PHL2}$ | " | 85 | | | | | | | " | OUT | | | | GND | IN | " | 2A to 2QD | " | " | " |
| | $t_{PHL3}$ | " | 86 | 7/ | IN | OUT | | | | " | | | | | | | " | 1CLR to 1QA | " | 44 | " |
| | | " | 87 | " | " | | OUT | | | " | | | | | | | " | 1CLR to 1QB | " | " | " |
| | | " | 88 | " | " | | | OUT | | " | | | | | | | " | 1CLR to 1QC | " | " | " |
| | | " | 89 | " | " | | | | OUT | " | | | | | | | " | 1CLR to 1QD | " | " | " |
| | | " | 90 | | | | | | | " | | | | OUT | IN | 7/ | " | 2CLR to 2QA | " | " | " |
| | | " | 91 | | | | | | | " | | | OUT | | " | " | " | 2CLR to 2QB | " | " | " |
| | | " | 92 | | | | | | | " | | OUT | | | " | " | " | 2CLR to 2QC | " | " | " |
| | | " | 93 | | | | | | | " | OUT | | | | " | " | " | 2CLR to 2QD | " | " | " |

See footnotes at end of device types 02.

TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases A,B,C,D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Measured terminal | Limits | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case 2 | 2 | 3 | 4 | 6 | 8 | 9 | 10 | 12 | 13 | 14 | 16 | 18 | 19 | 20 | | | | |
| | | | Test no. | 1A | 1CLR | 1QA | 1QB | 1QC | 1QD | GND | 2QD | 2QC | 2QB | 2QA | 2CLR | 2A | $V_{CC}$ | | Min | Max | |
| 10<br>Tc = 125°C | $F_{MAX1}$ | Same tests and terminal conditions as for subgroup 9, except $T_C$ = 125°C. | | | | | | | | | | | | | | | | | 25 | | MHz |
| | $t_{PLH1}$ | | | | | | | | | | | | | | | | | | 2 | 33 | ns |
| | $t_{PHL1}$ | | | | | | | | | | | | | | | | | | " | 33 | " |
| | $t_{PLH2}$ | | | | | | | | | | | | | | | | | | " | 93 | " |
| | $t_{PHL2}$ | | | | | | | | | | | | | | | | | | " | 93 | " |
| | $t_{PHL3}$ | | | | | | | | | | | | | | | | | | " | 56 | " |
| 11<br>Tc = -55°C | | Same tests and terminal conditions as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | |

1/ Apply  - - 2.0 V min./5.5 V max. to clear input and then to A input sufficient times prior to test to set the output high.
) ±0.2 V

2/ Apply  - - 2.0 V min./5.5 V max. pulse prior to test.
0.0 ±0.2 V

3/ $I_{IL}$ limits shall be as follows:

| Test | Min/Max limits (mA) | | | | |
|---|---|---|---|---|---|
| | Circuits | | | | |
| | A | E | B | D | F |
| $I_{IL1}$ | -.15/-.38 | -.12/-.36 | -.16/-.40 | -.12/-.36 | -.12/-.36 |
| $I_{IL2}$ | -.35/-1.60 | -1.0/-2.4 | -.35/-1.60 | -.35/-1.60 | -.35/-1.60 |

4/ A = 2.4 V min. and B = 0.4 V max.

5/ Output voltages shall be either:
a. H ≥ 2.5 V and L ≤ 0.4 V max when using a high speed checker double comparator, or
b. H ≥ 1.5 V and L ≤ 1.5 V when using a high speed checker single comparator.

6/ $F_{MAX1}$ minimum limit specified is the frequency of the input pulse.
The output pulse shall be one half the input frequency.

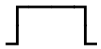
7/ Apply sufficient  - - 2.0 V min./5.5 V max. pulses to set output high prior to test.
0.0 ±0.2 V

TABLE III. Group A inspection for device type 03.

Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases E, F | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Measured terminal | Limits | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case 2 | 2 | 3 | 4 | 5 | 7 | 8 | 9 | 10 | 12 | 13 | 14 | 15 | 17 | 18 | 19 | 20 | | | | |
| | | | Test no. | 1CLK | 1CLR | 1QA | 1ST9 | 1QB | 1QC | 1QD | GND | 2QD | 2QC | 2QB | 2ST9 | 2QA | 2CLR | 2CLK | $V_{CC}$ | | Min | Max | |
| 1 Tc = 25°C | $V_{OH}$ | 3006 | 1 | 1/ | 2/ | -0.4 mA | 0.7 V | | | | GND | | | | | | | | 4.5 V | 1QA | 2.5 | | V |
| | | " | 2 | 3/ | " | | " | -0.4 mA | | | " | | | | | | | | " | 1QB | " | | " |
| | | " | 3 | 4/ | " | | " | | -0.4 mA | | " | | | | | | | | " | 1QC | " | | " |
| | | " | 4 | | 0.7 V | | 2.0 V | | | -0.4 mA | " | | | | | | | | " | 1QD | " | | " |
| | | " | 5 | | | | | | | | " | | | | 0.7 V | -0.4 mA | 2/ | 1/ | " | 2QA | " | | " |
| | | " | 6 | | | | | | | | " | | | -0.4 mA | " | | " | 3/ | " | 2QB | " | | " |
| | | " | 7 | | | | | | | | " | | -0.4 mA | | " | | " | 4/ | " | 2QC | " | | " |
| | | " | 8 | | | | | | | | " | -0.4 mA | | | 2.0 V | | 0.7 V | | " | 2QD | " | | " |
| | $V_{OL}$ | 3007 | 9 | | 2.0 V | 4 mA | 0.7 V | | | | " | | | | | | | | " | 1QA | | 0.4 | " |
| | | " | 10 | | " | | " | 4 mA | | | " | | | | | | | | " | 1QB | | " | " |
| | | " | 11 | | " | | " | | 4 mA | | " | | | | | | | | " | 1QC | | " | " |
| | | " | 12 | | " | | " | | | 4 mA | " | | | | | | | | " | 1QD | | " | " |
| | | " | 13 | | | | | | | | " | | | | 0.7 V | 4 mA | 2.0 V | | " | 2QA | | " | " |
| | | " | 14 | | | | | | | | " | | | 4 mA | " | | " | | " | 2QB | | " | " |
| | | " | 15 | | | | | | | | " | | 4 mA | | " | | " | | " | 2QC | | " | " |
| | | " | 16 | | | | | | | | " | 4 mA | | | " | | " | | " | 2QD | | " | " |
| | $V_{IC}$ | | 17 | -18 mA | | | | | | | " | | | | | | | | " | 1CLK | | -1.5 | " |
| | | | 18 | | -18 mA | | | | | | " | | | | | | | | " | 1CLR | | " | " |
| | | | 19 | | | | -18 mA | | | | " | | | | | | | | " | 1ST9 | | " | " |
| | | | 20 | | | | | | | | " | | | | -18 mA | | | | " | 2ST9 | | " | " |
| | | | 21 | | | | | | | | " | | | | | | -18 mA | | " | 2CLR | | " | " |
| | | | 22 | | | | | | | | " | | | | | | | -18 mA | " | 2CLK | | " | " |
| | $I_{IL1}$ | 3009 | 23 | | 0.4 V | | | | | | " | | | | | | | | 5.5 V | 1CLR | 5/ | 5/ | 5/ |
| | $I_{IL2}$ | " | 24 | 0.4 V | GND | | GND | | | | " | | | | | | | | " | 1CLK | " | " | " |
| | $I_{IL1}$ | " | 25 | | | | 0.4 V | | | | " | | | | | | | | " | 1ST9 | " | " | " |
| | $I_{IL1}$ | " | 26 | | | | | | | | " | | | | | | 0.4 V | | " | 2CLR | " | " | " |
| | $I_{IL2}$ | " | 27 | | | | | | | | " | | | | GND | | GND | 0.4 V | " | 2CLK | " | " | " |
| | $I_{IL1}$ | " | 28 | | | | | | | | " | | | | 0.4 V | | | | " | 2ST9 | " | " | " |
| | $I_{IH1}$ | 3010 | 29 | | 2.7 V | | | | | | " | | | | | | | | " | 1CLR | | 20 | µA |
| | $I_{IH2}$ | " | 30 | 2.7 V | | | | | | | " | | | | | | | | " | 1CLK | | 100 | " |
| | $I_{IH1}$ | " | 31 | | | | 2.7 V | | | | " | | | | | | | | " | 1ST9 | | 20 | " |
| | $I_{IH1}$ | " | 32 | | | | | | | | " | | | | | | 2.7 V | | " | 2CLR | | 20 | " |
| | $I_{IH2}$ | " | 33 | | | | | | | | " | | | | | | | 2.7 V | " | 2CLK | | 100 | " |
| | $I_{IH1}$ | " | 34 | | | | | | | | " | | | | 2.7 V | | | | " | 2ST9 | | 20 | " |
| | $I_{IH4}$ | " | 35 | | 5.5 V | | | | | | " | | | | | | | | " | 1CLR | | 100 | " |
| | $I_{IH5}$ | " | 36 | 5.5 V | | | | | | | " | | | | | | | | " | 1CLK | | 200 | " |
| | $I_{IH4}$ | " | 37 | | | | 5.5 V | | | | " | | | | | | | | " | 1ST9 | | 100 | " |
| | $I_{IH4}$ | " | 38 | | | | | | | | " | | | | | | 5.5 V | | " | 2CLR | | 100 | " |
| | $I_{IH5}$ | " | 39 | | | | | | | | " | | | | | | | 5.5 V | " | 2CLK | | 200 | " |
| | $I_{IH4}$ | " | 40 | | | | | | | | " | | | | 5.5 V | | | | " | 2ST9 | | 100 | " |
| | $I_{OS}$ | 3011 | 41 | 1/ | 2/ | GND | GND | | | | " | | | | | | | | " | 1QA | -15 | -100 | mA |
| | | " | 42 | 3/ | " | | " | GND | | | " | | | | | | | | " | 1QB | " | " | " |
| | | " | 43 | 4/ | " | | " | | GND | | " | | | | | | | | " | 1QC | " | " | " |
| | | " | 44 | | GND | | 5.5 V | | | GND | " | | | | | | | | " | 1QD | " | " | " |
| | | " | 45 | | | | | | | | " | | | | GND | GND | 2/ | 1/ | " | 2QA | " | " | " |
| | | " | 46 | | | | | | | | " | | | GND | " | | " | 3/ | " | 2QB | " | " | " |
| | | " | 47 | | | | | | | | " | | GND | | " | | " | 4/ | " | 2QC | " | " | " |
| | | " | 48 | | | | | | | | " | GND | | | 5.5 V | | GND | | " | 2QD | " | " | " |
| | $I_{CC}$ | 3005 | 49 | GND | 2/ | | GND | | | | " | | | | GND | | 2/ | GND | " | $V_{CC}$ | | 26 | " |
| 2 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = +125°C and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Same tests, terminal conditions, and limits as subgroup 1, except $T_C$ = -55°C and $V_{IC}$ tests are omitted. | | | | | | | | | | | | | | | | | | | | | | |

See footnotes at end of device type 03.

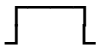
TABLE III. Group A inspection for device type 03 - Continued.

Terminal conditions (pins not designated may be high ≥ 2.0 V; low ≤ 0.7 V; or open).

| Subgroup | Symbol | MIL-STD-883 method | Cases E, F Case 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Measured terminal | Limits | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 3 | 4 | 5 | 7 | 8 | 9 | 10 | 12 | 13 | 14 | 15 | 17 | 18 | 19 | 20 | | | | |
| | | | Test no. | 1CLK | 1CLR | 1QA | 1ST9 | 1QB | 1QC | 1QD | GND | 2QD | 2QC | 2QB | 2ST9 | 2QA | 2CLR | 2CLK | $V_{CC}$ | | Min | Max | |
| 7 Tc = 25°C 6/ | Truth table tests | 3014 | 50 7/ | A | A | L | B | L | L | L | GND | L | L | L | B | L | A | A | 5.0 V | | 8/ | | |
| | | " | 51 | B | A | " | " | " | " | " | " | " | " | " | " | " | A | B | " | | | | |
| | | " | 52 | A | B | " | " | " | " | " | " | " | " | " | " | " | B | A | " | | | | |
| | | " | 53 | B | " | H | " | " | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 54 | A | " | H | " | " | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 55 | B | " | L | " | H | " | " | " | " | " | H | " | L | " | B | " | | | | |
| | | " | 56 | A | " | L | " | " | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 57 | B | " | H | " | " | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 58 | A | " | H | " | " | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 59 | B | " | L | " | L | H | " | " | " | H | L | " | L | " | B | " | | | | |
| | | " | 60 | A | " | L | " | " | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 61 | B | " | H | " | " | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 62 | A | " | H | " | " | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 63 | B | " | L | " | H | " | " | " | " | " | H | " | L | " | B | " | | | | |
| | | " | 64 | A | " | L | " | " | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 65 | B | " | H | " | " | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 66 | A | " | H | " | " | " | " | " | " | " | " | " | H | " | A | " | | | | |
| | | " | 67 | B | " | L | " | L | L | H | " | H | L | L | " | L | " | B | " | | | | |
| | | " | 68 | A | " | L | " | " | " | " | " | " | " | " | " | L | " | A | " | | | | |
| | | " | 69 | B | " | H | " | " | " | " | " | " | " | " | " | H | " | B | " | | | | |
| | | " | 70 | A | A | L | " | " | " | L | " | L | " | " | " | L | A | A | " | | | | |
| | | " | 71 | " | B | L | " | " | " | L | " | L | " | " | " | L | B | " | " | | | | |
| | | " | 72 | " | B | H | A | " | " | H | " | H | " | " | A | H | B | " | " | | | | |
| 8 | Same tests, terminal conditions, and limits as for subgroup 7 tests at $T_C$ = +125°C and $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | | | |
| 9 | $F_{MAX1}$ | 3003 | 73 9/ | IN | GND | OUT | GND | | | | GND | | | | | | | | 5.0 V | CLK to 1QA | 25 | | MHz |
| Tc = 25°C | $F_{MAX1}$ | Fig. 5 | 74 9/ | | | | | | | | " | | | | GND | OUT | GND | IN | " | CLK to 2QA | 25 | | MHz |
| | $t_{PLH4}$ | " | 75 | | 2/ | OUT | IN | | | | " | | | | | | | | " | ST9 to 1QA | 2 | 44 | ns |
| | $t_{PLH4}$ | " | 76 | | | | | | | | " | | | | IN | OUT | 2/ | | " | ST9 to 2QA | " | 44 | " |
| | $t_{PLH1}$ | " | 77 | IN | GND | OUT | GND | | | | " | | | | | | | | " | CLK to 1QA | " | 25 | " |
| | $t_{PLH1}$ | " | 78 | | | | | | | | " | | | | GND | OUT | GND | IN | " | CLK to 2QA | " | " | " |
| | $t_{PHL1}$ | " | 79 | IN | GND | OUT | GND | | | | " | | | | | | | | " | CLK to 1QA | " | " | " |
| | $t_{PHL1}$ | " | 80 | | | | | | | | " | | | | GND | OUT | GND | IN | " | CLK to 2QA | " | " | " |
| | $t_{PLH2}$ | " | 81 | IN | GND | | GND | | OUT | | " | | | | | | | | " | CLK to 1QC | " | 59 | " |
| | $t_{PLH2}$ | " | 82 | | | | | | | | " | | OUT | | GND | | GND | IN | " | CLK to 2QC | " | " | " |
| | $t_{PHL2}$ | " | 83 | IN | GND | | GND | | OUT | | " | | | | | | | | " | CLK to 1QC | " | " | " |
| | $t_{PHL2}$ | " | 84 | | | | | | | | " | | OUT | | GND | | GND | IN | " | CLK to 2QC | " | " | " |
| | $t_{PHL3}$ | " | 85 | 10/ | IN | OUT | GND | | | | " | | | | | | | | " | CLR to 1QA | " | 44 | " |
| | | " | 86 | " | " | | " | OUT | | | " | | | | | | | | " | CLR to 1QB | " | " | " |
| | | " | 87 | " | " | | " | | OUT | | " | | | | | | | | " | CLR to 1QC | " | " | " |
| | | " | 88 | " | " | | " | | | OUT | " | | | | | | | | " | CLR to 1QD | " | " | " |
| | | " | 89 | | | | | | | | " | | | | GND | OUT | IN | 10/ | " | CLR to 2QA | " | " | " |
| | | " | 90 | | | | | | | | " | | | OUT | " | | " | " | " | CLR to 2QB | " | " | " |
| | | " | 91 | | | | | | | | " | | OUT | | " | | " | " | " | CLR to 2QC | " | " | " |
| | | " | 92 | | | | | | | | " | OUT | | | " | | " | " | " | CLR to 2QD | " | " | " |
| | $t_{PHL4}$ | " | 93 | 10/ | GND | | IN | OUT | | | " | | | | | | | | " | ST9 to 1QB | " | 41 | " |
| | $t_{PHL4}$ | " | 94 | | | | | | | | " | | | OUT | IN | | GND | 10/ | " | ST9 to 2QB | " | 41 | " |
| 10 Tc = 125°C | $F_{MAX1}$ | Same tests and terminal conditions as for subgroup 9, except $T_C$ = +125°C. | | | | | | | | | | | | | | | | | | | 25 | | MHz |
| | $t_{PLH4}$ | | | | | | | | | | | | | | | | | | | | 2 | 57 | ns |
| | $t_{PLH1}$ | | | | | | | | | | | | | | | | | | | | " | 33 | " |
| | $t_{PHL1}$ | | | | | | | | | | | | | | | | | | | | " | 33 | " |
| | $t_{PLH2}$ | | | | | | | | | | | | | | | | | | | | " | 77 | " |
| | $t_{PHL2}$ | | | | | | | | | | | | | | | | | | | | " | 77 | " |
| | $t_{PHL3}$ | | | | | | | | | | | | | | | | | | | | " | 56 | " |
| | $t_{PHL4}$ | | | | | | | | | | | | | | | | | | | | " | 53 | " |
| 11 | Same tests, terminal conditions and limits as for subgroup 10, except $T_C$ = -55°C. | | | | | | | | | | | | | | | | | | | | | | |

See footnotes on next page.

1/ Apply  - - 2.0 V min./5.5 V max. prior to test after clear pulse.
0.0 ±0.2 V

2/ Apply  - - 2.0 V min./5.5 V max. pulse prior to test.
0.0 ±0.2 V

3/ Apply 2 pulses after clear pulse (see 1/).

4/ Apply 4 pulses after clear pulse (see 1/).

5/ $I_{IL}$ limits shall be as follows:

| Symbol | Min/Max limits (mA) | | |
|---|---|---|---|
| | Circuit | | |
| | A | E | B |
| $I_{IL1}$ (CLR) | -.15/-.38 | -.135/-.37 | -.16/-.40 |
| $I_{IL2}$ (ST9) | -.16/-.40 | -.135/-.37 | -.16/-.40 |
| $I_{IL3}$ | -.35/-1.6 | -1.0/-2.4 | -.35/-1.6 |

6/ Only a summary of attributes data is required.

7/ A = 2.4 V min. and B = 0.4 V max.

8/ Output voltages shall be either:
a. H ≥ 2.5 V and L ≤ 0.4 V when using a high speed double comparator, or
b. H ≥ 1.5 V and L ≤ 1.5 V when using a high speed single comparator.

9/ $F_{MAX1}$ minimum limits specified is the frequency of the input pulse. The output pulse shall be one half the input frequency.

10/ Apply sufficient  - - 2.0 V min./5.5 V max. pulses to set output high prior to test.
0.0 ±0.2 V

5. PACKAGING

5.1 Packaging requirements. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department of Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of the specification.

b. Complete part number (see 1.2).

c. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.

d. Requirements for certificate of compliance, if applicable.

e. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.

f. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.

g. Requirements for product assurance options.

h. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.

I. Requirements for "JAN" marking.

6.3 Superseding information. The requirements of MIL-M-38510 have been superseded to take advantage of the available Qualified Manufacturer Listing (QML) system provided by MIL-PRF-38535. Previous references to MIL-M-38510 in this document have been replaced by appropriate references to MIL-PRF-38535. All technical requirements now consist of this specification and MIL-PRF-38535. The MIL-M-38510 specification sheet number and PIN have been retained to avoid adversely impacting existing government logistics systems and contractor's parts lists.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCC-VQ, 3990 E. Broad Street, Columbus, Ohio 43123-1199.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535, MIL-HDBK-1331, and as follows:

$F_{MAX}$ ..... Maximum operating frequency
GND ..... Ground zero voltage potential
$I_{IN}$ ..... Current flowing into an input terminal
$V_{IC}$ ..... Input clamp voltage
$V_{IN}$ ..... Voltage level at an input terminal

6.6 Logistic support. Lead materials and finishes (see 3.4) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

| Military device type | Generic-industry type |
|---|---|
| 01 | 54LS390 |
| 02 | 54LS393 |
| 03 | 54LS490 |

6.8 Manufacturers' designation. Manufacturers' circuits, which form a part of this specification, are designated with an "X" as shown in table IV herein.

TABLE IV. Manufacturer's designator.

| Device type | Manufacturer | | | | |
|---|---|---|---|---|---|
| | Texas Instruments | Signetics Corp. | Motorola Inc. | Fairchild Co. | National Semiconductor |
| | Circuit A | Circuit B | Circuit D | Circuit E | Circuit F |
| 01 | X | X | | X | |
| 02 | X | X | X | X | X |
| 03 | X | X | | X | |

6.9 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5962-1977)

Review activities:
Army - MI, SM
Navy - AS, CG, MC, SH, TD
Air Force - 03, 19, 99

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

**INSTRUCTIONS**

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

| **I RECOMMEND A CHANGE:** | 1. DOCUMENT NUMBER<br>MIL-M-38510/327B | 2. DOCUMENT DATE *(YYYYMMDD)*<br>2003-09-15 |
|---|---|---|

3. DOCUMENT TITLE
MICROCIRCUITS, DIGITAL, BIPOLAR, LOW-POWER SCHOTTKY TTL, COUNTERS, MONOLITHIC SILICON

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

| a. NAME *(Last, First Middle Initial)* | b. ORGANIZATION | |
|---|---|---|
| c. ADDRESS *(Include Zip Code)* | d. TELEPHONE *(Include Area Code)*<br>(1) Commercial<br>(2) DSN<br>*(If applicable)* | 7. DATE SUBMITTED<br>*(YYYYMMDD)* |

8. PREPARING ACTIVITY

| a. NAME<br>Defense Supply Center, Columbus | b. TELEPHONE *(Include Area Code*<br>(1) Commercial 614-692-0536 (2) DSN 850-0536 |
|---|---|
| c. ADDRESS *(Include Zip Code)*<br>DSCC-VA<br>P. O. Box 3990<br>Columbus, Ohio 43216-5000 | IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:<br>Defense Standardization Program Office (DLSC-LM)<br>8725 John J. Kingman Road, Suite 2533<br>Fort Belvoir, Virginia 22060-6221<br>Telephone (703)767-6888 DSN 427-6888 |